Quadratics Word Problem Review

The Pie Club bakes pies and sells them to raise money for charity. Their annual profit is modeled by the quadratic relation $P = -2(x-12)(2x-7)$, where x represents the number of pies sold in hundreds and P represents their annual profit in hundreds of dollars. What is the company's maximum profit?

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Factored Form
Vertex

$\frac{s+r}{2} = x_{vertex}$

$P = -2(x-12)(2x-7)$

$r = 12 \quad s = 7/2 \ (3.5)$

$\frac{r+s}{2} = \frac{12+3.5}{2} = \frac{15.5}{2} = 7.75$

$P = -2(7.75-12)(2(7.75)-7)$

$P = -2(-4.25)(15.5-7)$

$P = -2(-4.25)(8.5)$

$P = (8.5)(8.5)$

$= 72.25$

$(7.75, 72.25)$

If they sell 775 pies they make a max profit of 7225.00.

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37. The height of a tossed stone relative to time is described by the relation $y = -2x^2 + 10x$, where x is the time in seconds after the stone is tossed and y is the stone's height in meters.
a) For how many seconds is the stone in the air?
b) What is the maximum height of the stone?
c) How high is the stone after 3s?

Standard Form

a) zeros – factored form

b) vertex – K value

vertex form

$\frac{s+r}{2} = x_{vertex}$

c) root – substitution

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Standard Form
a) zeros – factored form
b) vertex – K value
vertex form
$\frac{s+r}{2} = x_{vertex}$
c) root – substitution

$y = -2x^2 + 10x$

$y = -2x(x-5)$

0 5

$\frac{0+5}{2} = 2.5$

$y = -2(2.5)^2 + 10(2.5)$

$y = -2(6.25) + 25$

$y = -12.5 + 25$

$y = 12.5$

$t = 3$

c) $y = -2x^2 + 10x$

$y = -2(3)^2 + 10(3)$

$y = -2(9) + 30$

$y = -18 + 30$

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The formula for the daily profit at the Kanata Wave Pool is $P = -4x^2 + 120x - 500$ where P is the profit, in dollars, and x is the admission price, in dollars.
a) What price should they charge to break even?
b) What price should they charge to maximize daily profit?
c) What is the maximum daily profit?

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38. The formula for the daily profit at the Kanata Wave Pool is $P = -4x^2 + 120x - 500$ where P is the profit, in dollars, and x is the admission price, in dollars.
a) What price should they charge to break even?
b) What price should they charge to maximize daily profit?
c) What is the maximum daily profit?

Standard

a) zeros – Factor / Quad Formula

b) vertex

$\frac{s+r}{2}$ / Complete the Square h

c) K

$P = -4(x^2 - 30x + 125)$

$P = -4(x^2 - 5x - 25x + 125)$ −30 | M 125

$P = -4(x(x-5) - 25(x-5))$ −5 −25

$P = -4(x-5)(x-25)$

At \$5/ticket and \$25/ticket they will break even

b) Max $\frac{5+25}{2}$

$= 15$/ticket

$P = -4x^2 + 120x - 500$

$P(15) = -4(15)^2 + 120(15) - 500$

$P(15) = -4(225) + 1800 - 500$

$P(15) = -900 + 1800 - 500$

$P(15) = \$400$

The pool must charge \$15/ticket to reach a max profit of \$400/day

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A ball is thrown upwards from a cliff. It's height above the ground, h, in metres, is model the relation $h = -5t^2 + 15t + 20$, where t is the time in seconds.

a) How high is the cliff?
b) How high is the ball above the ground after 2s?
c) When does the ball reach its maximum height?
d) What is the maximum height?
e) When does the ball hit the ground?
f) When is the ball 30m above the ground?

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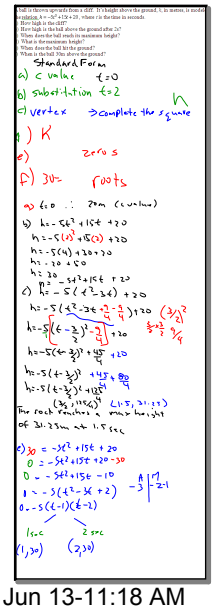

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